

# Biomechanical Prosthetic Limbs

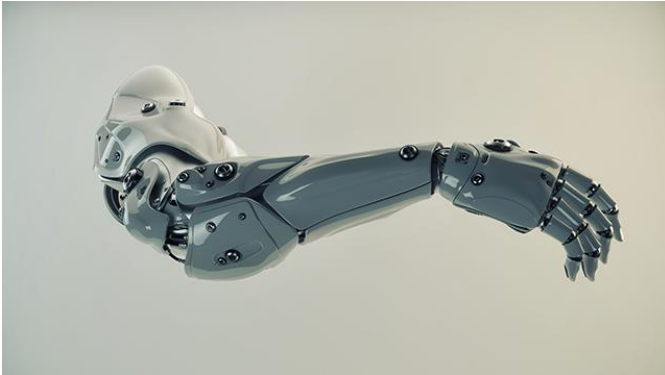
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## I. INTRODUCTION

Biomechanical engineering is the application of mechanical engineering to human biological systems. Prosthetic limbs are a field of focus within biomechanical engineering dealing with the production of advanced prosthetics using higher technologies than more commonly used artificial body parts. The prosthetics that will be mainly talked about are limb prosthetics including mechanical legs, arms, and hands.

## II. METHODS

The production of prosthetic limbs include a few different types of engineering and mechanical devices. Electrical engineering is used for wiring and circuitry, mechanical engineering is used for motors and framework, computer engineering for programming, and biomedical engineering for design and the technology used to interact with the human body. This is an example of a prosthetic arm and hand:



All of these fields are applied by biomedical engineers and use physics, mathematics, and certain areas of biology.

## III. RESULTS

In North America there are approximately 50,000 limb losses per year with nearly 350,000 amputees living currently. Of these amputees, the ratio of arm to leg amputations is 1:4 and the median age is 65 years old. These amputations are caused by many different things ranging from cardiovascular problems to accidents severely damaging limbs. Only about half of amputees receive prosthetics due to high costs and some inefficiencies.

## IV. DISCUSSION

The fact that only one half of the amputee population receives prosthetics shows that they have to be made more efficiently. New models are becoming more advanced but have greatly increased in price due to the technology used. More current technologies include sensory inputs that make the hand feel more natural, advanced motor sequences allowing more movement, flexibility, and functionality, and lastly the use of electrical sensors to pick up nerve signals in order to control the prosthetic with one's mind. Finding a cheap way to create these technologies and newer prosthetics is key to their production and usage. New creation processes include three dimensional virtual building of prosthetics including designs and fitting.

## REFERENCES

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